Grads in Industry:

Arno C. Fieldner, '06

By Roger Scott, I.E. 3

This is the second in a series of articles designed to acquaint you with a few of the prominent Graduate Engineers of Ohio State University. In this issue I desire to present to you a brief account of some of the noteworthy accomplishments of Dr. Arno C. Fieldner, one of the foremost research scientists of the nation and an employee of the United States Government since 1907.

Arno C. Fieldner, Chief of the Technologic Branch of the Bureau of Mines, was one of the first two to graduate with degree of Bachelor of Science in Chemical Engineering from The Ohio State University in 1906.

In 1940, his Alma Mater presented him the Joseph Sullivant Medal for meritorious research and leadership in fuel technology. The Sullivant Medal is awarded once in five years to a graduate of The Ohio State University for notable achievement. It was established in 1920 by the late Professor Thomas C. Mendenhall in memory of Joseph Sullivant, a member of the first Board of Trustees of The Ohio State University.

Mr. Fieldner was advanced in 1936 to the position of Chief of the Technologic Branch of the Bureau of Mines. This branch of the United States Geological Survey was the predecessor of the United States Bureau of Mines. Mr. Fieldner accepted an appointment in the Survey to work on fuel problems under the directions of the late Professor N. W. Lord, who was at that time Director of the School of Mines at The Ohio State University and Chief Chemist of this Survey. This branch now includes six divisions which relate to metallurgy, non-metals, mining, explosives, coal, petroleum, and natural gas. He also is Chief Engineer of the Coal Division and thus continued his personal interest in the chemistry and technology of coal. His outstanding contribution in this field in recent years has been the initiation of research by the Bureau of Mines on the hydrogenation and liquefaction of American coals in preparation for the day when declining petroleum resources may require the production of motor fuel and Diesel oil from our more abundant fuel resources of coal. The Central Experiment Station of the Bureau of Mines at Pittsburgh, Pennsylvania, has the only experimental coal hydrogenation plant in this country.

At the present time Mr. Fieldner is giving general supervision to the Bureau's work on the production of minerals from domestic sources that are of strategic

Mr. Arno C. Fieldner

importance in the national defense. He is Secretary of the Technologic Committee on Manganese of the National Research Council and the National Academy of Sciences. During Mr. Fieldner's administration of the Bureau of Mines the facilities for experimental research in the mineral industries were expanded and placed on a more permanent basis by the construction and equipment of government-owned buildings for the Southern Experiment Station at the University of Alabama, Tuscaloosa, Alabama, the Eastern Experiment Station at the University of Maryland, College Park, Maryland, the Petroleum Experiment Station at Barttesville, Oklahoma, and an Electrometallurgical Laboratory at Boulder City, Nevada.

Among the distinctions and responsibilities which came to Mr. Fieldner in 1936 were the election to Presidency of the American Society for Testing Materials and the presentation of the Honorary Degree of Doctor of Science by the University of Alabama.

Since 1938 Mr. Fieldner has served on the Energy

Resources Committee of the National Resources Planning Board. He is deeply interested in the promotion of research and has advocated at all times the increase of research in industry in universities and in governmental institutions. He is a member of the Board of Directors of The Ohio State University Research Foundation and believes that chemistry, physics and chemical engineering offer splendid opportunities to those who wish to devote their lives to research.

Mr. Fieldner was one of the first two of the Ohio State graduates to receive the Lamme Medal which is the result of a bequest made by a graduate from The Ohio State University in 1888, Mr. Benjamin Garver Lamme. Mr. Lamme was always a firm believer in the promotion of engineering education. A gold medal is to be given annually to a graduate of one of the technical departments of Ohio State University for meritorious accomplishments in engineering. Mr. Fieldner received the award in 1931.

In 1924 and also in 1929, Mr. Fieldner spent several months in Europe visiting industrial plants and laboratories and studying mine research as safety, carbonization and processing of coal. Mr. Fieldner has been the author and co-author of numerous scientific and technical publications in his chosen field of science. These have to do with the compositions, properties, and utilization of our natural fuels. He is a member of the Cosmos Club of Washington, D. C., Coal Research Club of London, and is the American editor of **Fuel in Science and Practice.**

Mr. Fieldner, and his staff at the Pittsburgh Experiment Station, in cooperation with Kettering's General Motors Research Corporation, undertook the investigation of the toxicity of exhaust gases from ethyl gasoline. It was on the basis of this work that the use of tetra-ethyl lead was permitted by health authorities. For three years, Mr. Fieldner worked on a request made by The American Gas Association to search for substances which might be added to odorless gas to give the gas a detectable order to warn agents of the escape of gas. Several suitable substances were discovered which gave off strong warning odors. The research also demonstrated that certain substances possessed an irritating nature, as croton-aldehyde, which would waken persons before they might be overcome by the gas. Some of these are used regularly in natural gas in the state of California.

In June 1921, Mr. Fieldner held the position of Superintendent of the Pittsburgh Experiment Station. In July 1925, he was appointed Chief Chemist of the Bureau of Mines, with headquarters at Pittsburgh, still retaining charge of the Station as superintendent. In 1927, he was placed in administrative charge of the Bureau's Experiment Stations Division with headquarters in Washington, D. C.

Mr. Fieldner was in charge of the Bureau of Mines research conducted for designing the ventilation of the Holland Tunnel under the Hudson River, New York, the world's first vehicular tunnel for automobiles. These researches gave the amount and composition of automobile exhaust gases under operating conditions, together with the minimum safe concentration of these gases. In 1923, the University conferred the professional degree of Chemical Engineer in recognition of this work. During the completion of the Holland Tunnels, Dr. A. C. Fieldner and Dr. S. H. Katz devised a sensitive continuous carbon monoxide recorder that would record percentages of carbon monoxide in tunnel atmospheres as little as five parts of carbon monoxide in one million parts of air. This apparatus, is now in daily use in the Holland Tunnels, in the Oakland-Alameda Tunnel in California, and in the Mersey Tunnel at Liverpool, England.

When the United States entered into the World War, Mr. Fieldner was placed in charge of the government's war gas investigations. He had three laboratories in operation in three weeks on the grounds of the Pittsburgh Experiment Station of the Bureau of Mines, testing charcoals and soda-limes against various poisonous gases for use in American gas masks. He developed the methods used for testing the efficiency of gas masks and absorbents used by the United States and Allied Armies. He holds a patent on a multiple gas mask testing machine that simulates human breathing. This Pittsburgh work constituted the Gas Mask Research Division of the Chemical Warfare Service and was soon transferred to the American University, Chemical Warfare Section at Washington, D. C. Mr. Fieldner was placed in charge with the rank of Major. One of the accomplishments of this division was the invention of a mask for protection against ammonia fumes. This mask is standard equipment around ammonia refrigerating machinery. Under his direction a universal gas mask for use by city firemen and for the fighting of fires in coal mines was developed and these are now in common use.

The Fieldner electric volatile matter furnace is used in most coal laboratories, and the method which he standardized for determining the fusibility of coal ash has been adopted as standard by the Government and the testing societies.

Dr. Fieldner won an international reputation for the merit of his researches in fuel technology. During his student days he worked under the inspiration of the late Professor Nathaniel W. Lord in the chemistry of coal and gas. After a short apprenticeship with the Denver Gas and Electric Company, he went to the American Zinc and Chemical Company, Denver, Colorado, as chemist and assayer in 1907. Following this work he entered the United States Government Service as fuel chemist at Pittsburgh, Pennsylvania.

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Aside from work Mr. Fieldner likes to hunt and fish. His favorite region for his sport is in and around the Temagami Forest Reserve. While on one of his trips he discovered a new sub-species of brook trout. The discovery was reported to the Carnegie Museum at Pittsburgh and they sent an expedition the next year. These trout, now called Auro Trout (Fontinelis temagamiensis) are on exhibition at the Carnegie Museum at Pittsburgh, Pennsylvania.